

REMARKS

Claims 1-62 remain pending.

The Examiner rejected claims 1-11, 19-26, 28-29, and 36-52, 54, 55, 61, and 62 under 35 U.S.C. §103(a) as being unpatentable over Otani (U.S. patent 6,351,469). The Examiner has also rejected the remaining claims under 35 U.S.C. §103(a) as being unpatentable over Otani in view of one or more secondary references Eng (U.S. patent 5,963,557), Friedman (U.S. patent 5,949,788), and Data-Over-Cable Service Interface Specification (DOCSIS), Radio Frequency Interface Specification, SP-RFI-I02-971008, Interim Specification, Cable Television Laboratories, 1997 (herein referred to as DOCSIS-1997).

Claim 1 is directed towards a "method for transmitting upstream data from a cable modem within a cable plant." Claim 1 also requires "selecting a first upstream channel for transmission of a first portion of the upstream data and selecting a second upstream channel for transmission of a second portion of the upstream data, wherein the selection of the first and second upstream channels is based on a criteria selected from a group consisting of a load balancing criteria and a data type criteria." Claim 1 also recites "transmitting the first portion of the upstream data on the first upstream channel from a first PHY block of the cable modem" and "transmitting the second portion of the upstream data on the second upstream channel from a second PHY block of the cable modem, the second upstream channel differing from the first upstream channel in their respective frequency ranges, wherein the first PHY block differs from the second PHY block." Claim 36 is directed towards a computer readable medium having computer readable code for performing operations similar to the operations of claim 1. Claim 61 is directed towards an apparatus having means for performing operations similar to the operations of claim 1.

Claim 11 is directed towards a "cable modem." Claim 11 requires the cable modem to include "a processor configured to initiate selective transmission on multiple upstream channels, wherein the selective transmission on multiple upstream channels is based on a criteria selected from a group consisting of a load balancing criteria and a data type criteria" and "an upstream transmitting component operating in conjunction with the processor and configurable by the processor to transmit data over multiple upstream channels through different PHY blocks, wherein the multiple upstream channels are assigned within a downstream channel received into the cable modem and wherein the first upstream channel has a different frequency range than the second upstream channel."

Claim 19 is directed towards a "head end for receiving upstream data from a cable modem, comprising a splitter that receives an upstream signal from the cable modem, the upstream signal including a first portion of the upstream data on a first upstream channel and a second portion of the upstream data on a second upstream channel that differs from the first upstream channel and wherein the first upstream channel has a different frequency range than the second upstream channel, the splitter being arranged to separate the first portion of the upstream data transmitted over the first upstream channel from the second portion of the upstream data transmitted over the second upstream channel for further processing of the separated data, wherein the head end is further operable to assign the first upstream channel and the second upstream channel to the cable modem, wherein the first and second upstream channels have been selected for transmission of their respective data from different PHY blocks based on a load balancing criteria or a data type criteria." Claim 62 also has the limitation "wherein the first and second upstream channels have been selected for transmission of their respective data from different PHY blocks based on a load balancing criteria or a data type criteria."

Claim 20 is directed towards a "method of transmitting upstream data from a cable modem over multiple upstream channels within a cable plant." Claim 20 also requires "receiving a downstream signal within a downstream channel into the cable modem" and "configuring the cable modem to transmit over a first upstream channel specified in the downstream signal." Claim 20 further includes "configuring the cable modem to transmit over a second upstream channel which has a different frequency range than the second upstream channel if the second channel is specified in the downstream signal" and "selectively transmitting different data portions over the first and second channels through two different PHY blocks based on a criteria selected from a group consisting of a load balancing criteria and a data type criteria." Claim 37 is directed towards a computer readable medium having computer readable code for performing operations similar to the operations of claim 20.

Claim 35 is directed towards a "cable modem" that includes "a first media access controller associated with a first memory portion into which data is written for transmission upstream from the cable modem" and "a second media access controller associated with a second memory portion into which data is written for transmission upstream from the cable modem." Claim 35 also requires "a first PHY block coupled with the first media access controller" and "a second PHY block coupled with the second media access controller." Claim 35 also requires "a processor configured to receive a downstream signal within a downstream channel into the cable modem, configure the first PHY block to transmit data over a first upstream channel obtained from the downstream signal, configure the second PHY block to transmit data over a second upstream channel having a different frequency than the first upstream channel and obtained from the downstream signal if the second upstream channel is available, select the first upstream

channel for transmission of a first data portion by writing to the first memory portion of the first media access controller so that the first data portion is transmitted through the first PHY block and select the second upstream channel for transmission of a second data portion by writing to the second memory portion of the second media access controller so that the second data portion is transmitted through the second PHY block, wherein selection of the first and second channels is based on a criteria selected from a group consisting of a load balancing criteria and a data type criteria.

Embodiments of the present invention provide mechanisms for selectively transmitting data on different upstream channels having different frequency ranges using different PHY blocks, where such selective transmission of the upstream channels is based on either a load balancing or data type criteria. Other embodiments of the present invention provide mechanisms for receiving data from different upstream channels having different frequency ranges using different PHY blocks, where such selective transmission of the upstream channels was based on either a load balancing or data type criteria.

In order to establish a prima facie case of obviousness, MPEP 2143 requires among other things that the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Although the Examiner argued that it would be obvious to add a mechanism for transmitting different data portions on different upstream frequency channels of a cable modem to the system of Otani, it is respectfully submitted that Otani lacks motivation for modifying its systems in such a way and teaches away from making such modification.

To further elaborate, the primary reference Otani discloses a system having mechanisms for transmitting time multiplexed data and voice from a cable modem, rather than transmitting data on channels having different frequency ranges from the cable modem, in the manner claimed. This type of time multiplexing requires a processor for selectively dividing the data into different time slots. That is, the Otani system is already configured to divide the data in a time multiplexed manner. One would not be motivated to modify the system of Otani to include frequency multiplexing since this modification would require extensive modification and would yield only incremental improvements over the current time multiplexing already implemented by the system of Otani. To achieve frequency modification, the system of Otani would have to be modified to include at least the following modifications, for example: adding an additional PHY block for physical transmission of another frequency channel, modification of the transmission controller to selectively transmit data onto different frequency channels, modify the processor

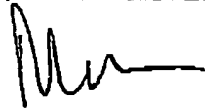
configuration that handles the TDMA transmission to work with the additional feature of transmitting on different frequency channels. The integration of the TDMA transmission function and the multiplexed frequency transmission function would also require that the timing of the data transmission be modified so that the data is selectively transmitted to the different frequency channels based on either data type or load balancing, and this timing of the frequency channel transmission would have to be coordinated with the timing of the TDMA transmission. Additionally, the timing of the upstream data transmission multiplexed in both time and frequency would have to be configured and coordinated at each cable modem in the cable modem plant (e.g., by the head end).

In sum, one cannot simply add a mechanism for selectively transmitting on different frequency channels from a different type of system (i.e., not a cable modem system) into the cable modem system of Otani, which utilizes TDMA multiplex transmission without integrating and coordinating the TDMA and frequency multiplexing functions. Most importantly, there is no reasonable expectation of success that such a multiplex frequency mechanism will work in a TDMA transmission cable modem system without substantial modifications. The reasonable expectation of success is only taught in the Applicant's disclosure and not taught or suggested in the prior art. Please note the different issues (e.g. timing upstream data transmission among a plurality of cable modems, etc.) that arise within a cable modem system. Further discussion on these issues is provided in Applicant's specification, page 16, 2nd Paragraph. In view of the above, it is respectfully submitted that claims 1, 11, 20, 36, and 37 are patentably distinct from the cited art.

The Examiner's rejections of the dependent claims are also respectfully traversed. However, to expedite prosecution, all of these claims will not be argued separately. Claims 2-10, 12-18, 21-34, and 38-60 each depend directly from independent claims 1, 11, 20, 36, or 37 and, therefore, are respectfully submitted to be patentable over cited art for at least the reasons set forth above with respect to claims 1, 11, 20, 36, or 37. Further, the dependent claims require additional elements that when considered in context of the claimed inventions further patentably distinguish the invention from the cited art.

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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